

CLAIMS

What is claimed is:

- 1 1. A key-pad device comprising:
2 a key-pad including a plurality of keys; and
3 a key-pad controller providing a key value signal when one of the keys is
4 activated, said controller determining which key is activated by a
5 process including a predetermined number of steps, wherein the
6 process has the same number of steps regardless of which key is
7 activated.
- 1 2. The device according to claim 1 further comprising a display and a
2 magnetic strip reader.
- 1 3. The device according to claim 1 wherein the plurality of keys are
2 arranged in a plurality of rows and a plurality of columns.
- 1 4. The device according to claim 3 wherein the controller determines if
2 more than one key has been activated in more than one column.
- 1 5. The device according to claim 4 wherein the controller adds a counter
2 value to a counter if a key is activated in a column, and wherein
3 the controller determines which column is being monitored for a
4 key activation by a set bit in a digital word.
- 1 6. The device according to claim 3 wherein the controller determines
2 which key has been activated on a row-by-row basis.
- 1 7. The device according to claim 6 wherein each key is assigned a
2 predetermined key press value, said controller adding the key
3 press values of activated keys.
- 1 8. The device according to claim 7 wherein the controller compares the
2 added key values to a predetermined value to determine if
3 multiple keys have been activated.

1 9. The device according to claim 7 wherein the controller subtracts the
2 added key value from a predetermined value to calculate a key
3 value to be transmitted.

1 10. A key-pad device for transferring a key value representative of a key
2 press to a terminal, said device comprising:
3 a key-pad including a plurality of keys arranged in a plurality of rows
4 and a plurality of columns; and
5 a key-pad controller outputting the key value to the terminal when one
6 of the keys is pressed, said controller determining the key that is
7 pressed by a process including a predetermined number of
8 steps, where the number of steps is the same regardless of
9 which key is pressed, said controller determining if more than
10 one key has been pressed in more than one column, and then if
11 only one key has been pressed, determining which key has
12 been pressed on a row-by-row basis by adding key press values
13 for each key that is pressed.

1 11. The device according to claim 10 wherein the controller adds a counter
2 value to a counter if a key is pressed in a column, and wherein
3 the controller determines that more than one key has been
4 pressed in more than one column if the counter value in the
5 counter is greater than a predetermined value.

1 12. The device according to claim 10 wherein the controller adds the key
2 press value for each key pressed in a particular row before
3 moving on to a next row.

1 13. The device according to claim 10 wherein the controller compares the
2 added key value to a predetermined value to determine if
3 multiple keys have been pressed.

1 14. The device according to claim 10 wherein the controller subtracts the
2 added key value from a predetermined value to determine the
3 key value to be transmitted to the terminal.

1 15. A method of determining which key of a key-pad device having a
2 plurality of keys arranged in a plurality of rows and a plurality of columns has
3 been pressed, comprising:
4 assigning each key a key press value;
5 determining if a key has been pressed in one of the columns;
6 advancing a counter by a counter value if a key has been pressed;
7 determining if a key has been pressed in a next column and adding the
8 counter value to the counter if a key has been pressed,
9 otherwise keeping the counter value the same;
10 adding the key press value of all of the keys that have been pressed in
11 a first row to generate a first row added key value;
12 adding the key press value of all of the keys that have been pressed in
13 a second row and adding the added key press values of the
14 second row to the added key value;
15 determining whether the added key value exceeds a predetermined
16 value; and
17 transferring the key value from the key-pad device if the added key
18 value does not exceed the predetermined value.

1 16. The method according to claim 15 wherein the key-pad includes four
2 rows and four columns, and wherein advancing the counter for
3 each pressed key in each column is performed for all four
4 columns, and wherein adding the key press values for all of the
5 keys is performed for all four of the rows.

1 17. The method according to claim 15 further comprising subtracting the
2 added key value from a predetermined value to calculate the
3 key value that is transmitted.

- 1 18. The method according to claim 15 wherein determining if a key has
2 been pressed in one of the columns includes setting a set bit for
3 a particular column if a key has been pressed in that column.